SEQUENCE LISTING

<110> Gopalan, Venkat
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<120> Novel Bacterial RNase P Proteins and
Their Use in Identifying Antibacterial Compounds

<130> 50093/016001

<140> US 09/516,061
<141> 2000-03-01

<160> 95

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<212> DNA
<213> Streptococcus mutans

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ggacgaagtg ttgccaatcg gaaatttgtt gtctatagtt tagaaaaaga tcaaagtcac 180
tatcgtgttg gactttcagt tggaaaaaga ttaggaaatg ctgtcgttag aaatgcgatt 240
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gttgttattg ctagaaaagg tgttgaggaa cttgattata gcacgatgaa aaaaaatctg 360
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<210> 2
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<212> DNA
<213> Klebsiella pneumoniae

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<210> 3
<211> 455
<212> DNA
<213> Salmonella paratyphi

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acgccgcaaa tcaccatcct cggccgcctg aattcgctgg ggcatccccg tatcggtctt 180
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cgccgccact gtcgcctggc tcgcgggtcc tgatagccct tattcgggtc tatcaacgcc 420
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<210> 4
<211> 528
<212> DNA
<213> Pseudomonas aeruginosa

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<210> 5
<211> 510
<212> DNA
<213> Corynebacterium diphtheriae

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tcgcgcattg tttgatgcgg tgcggttcta 510

C1 Cont

<210> 6
<211> 504
<212> DNA
<213> Chlamydia trachomatis

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gcaactttac gaatagttcc ttctcgtcat tcgaacatcc gtaaagtagg ggttactgtt 240
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tttaggcatg tgcgaccaaa tcttcccgca tgtcaagtgg tagtgtctcc taaaggggc 360
actctaccaa attttggtaa actatccgcg gatcttctta agcatattcc agaggctttg 420
cctctcgtta cttcttctaa gtagtttttt attttggtca aaaaataaaa aaccattcca 480
cgctatagag gcatggaatg ggaa 504

<210> 7
<211> 492
<212> DNA

<213> Vibrio cholerae

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ttcattgctc aaatcttgcg cgctcttttt ggcgatgaca acaaaatctt tgttagccag 180
ttgattttga tgtaagcgaa agctttctct gcaaatacgt ttgaatcgat tacggccgac 240
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agcgcgagcg atgattgtga gatgaggaga accagcactg tgagcttgct ggaagacttt 360
ttgataatgt tcgggagtta acaaacgtaa ctcccgattg aatgcgtacg tactcaaaat 420
aattcgagat tattttgaca ggcgcttacg gccttttgca cgacgtgcat tcagaacttt 480
acgaccgttc gc 492

<210> 8
<211> 492
<212> DNA
<213> Neisseria gonorrhoea

<400> 8
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ccttgcctgt tttgcggtag ccctgtcgaa tttccggcgg acgcgcacga cgaaatcctg 180
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cagcccgttg ccgtttgagc gcgaaacttg cagcaggtcg cggctgcggc ggtttctgaa 360
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gtccaaaatt acactgccag gcgtttgcgg cctttggcac ggcgtgcggc caatactgcg 480
cgtccgccgc gt 492

<210> 9
<211> 492
<212> DNA
<213> Neisseria meningitidis

<400> 9
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cggcggcagc cggtttttgt tcaatctgaa ccagtcgcgg atgacgcgct tcatataatt 240
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gtccaaaatt acaccgccag gcgtttgcgg cctttggcgc gccgtgcggc caatactgcg 480
cgtccgccgc gc 492

C1 Cont.

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<211> 462
<212> DNA
<213> Streptococcus pyogenes

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atgtaaattt tgttgaagct cttgatactc caaagattcg acacccttac gggcaatcac 180
cacgaaatcc tctgacttca gctgatgccc taatgccatg ataacatgac gtatctttcg 240
tttgactgca tttctggtga ctgcatttcc tatttttta ccgacagaaa tacccacacg 300
gaagtggtct tggcctctat ttaaatgata aatgacaaat tttcgatttg ctgtactttt 360
tccatcctta aatatggctt ggaaatcttt ctcacgcttg acacgatagg tcttcttcaa 420
aatttaactc caatatctaa attattacca ttataccaca tc 462

<210> 11
<211> 492
<212> DNA
<213> Bordetella pertussis

<400> 11
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tcatcgcgct atccgtgtga agtgagcatc tacttcggcg cgcgccgagc gtttcagggc 120
cgtgaggctt gccggtgtca gcttgctgtg cagccgcacc acgtaatcct gggccggcag 180
ggcaagccgg cgagcccgga acgcttcgcg gatgacccgc ttcaaggtat tgcgcgtcac 240
ggcgcgggcg gcaaaacgct tggcgatcac caggcccagg cgcgcgcgcg ccggctggtc 300
atcagcaggg gcacagggcg aggcgctgac aataaagaaa gcccctcggg ccagtcgccg 360
gcctttgagg gcggcggcaa actcggaggg gcgatgcaat cgcgcctccg cagggagcgt 420
ggcgcgcggc atgggtgacg tgacggagac tggcgacggg gccggcggcg atgctcctgt 480
tacaggcaat cc 492

<210> 12
<211> 534
<212> DNA
<213> Porphyromonas gingivalis

<400> 12
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ttactcgttt ttcaaagccg atgaaggtac atttccggca attctgatca gactcttttg 120
catcgctctc tccactgtac gaaagtcagg aagttcatcc gatactacca taaatgcaat 180
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gcgaagatag aggcgttcgc ttttggatag gccgaatgta ggcggagagg tcatttcccg 480
ttgaggtaat cctctaatgc catagccata gaaggatatt gctcggtcgg cgca 534

<210> 13
<211> 495
<212> DNA
<213> Streptococcus pneumoniae

C1 Cont

<400> 13
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taatacatgg agtagatttt tctccatctc tgcgtatccc aaggtttcga ctccttttcg 180
agcaatgaca acaaagtcga catcttctac cagactccct tttgcattct ggataatatg 240
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tagacctact cgaaaacggt ttttctggtt ttctaattgg tagaccacaa atttgcgatt 360
agcaaaactt gtcccctcct tgaaaatcgc cttaaaatct ttctctcttt ttacacgaaa 420
gtttttcttc aaaactcaac tccatctatt aaattactac tattatacca tatttttcaa 480
aaaagccaat catag 495

<210> 14
<211> 465
<212> DNA
<213> Clostridium difficile

<400> 14
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agtagcatcc ttactagata cccttgctat aaatactata tcatatccag gcttaatttt 180
ttcatcaata tttaatctgt aggcttcttt tattaatctt cttactctat tcctagtaat 240
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aagtatatat attactaaat atttgtttgc aaaagatttg ccgtgtttat atacttttct 360
aaaatcagag tctttttttca acccctttagt cctattaaag tccatagtta acctccataa 420
acacagctat gaatcgtaat tatttacaca aaaaggccac ctttg 465

<210> 15
<211> 447
<212> DNA
<213> Camphylobacter jejuni

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agaaagttca gtgatttcat ttttagctac aaaaatatat ttgccatctt gaagatatct 180
ttcaaactta gcaaacaaag ctcttaaaat tcgttttgaa cgatttctaa ccactgcttt 240
tccaactttt ttactagcaa caactgctat tttttttttca taactattca gataaaaaat 300
gatcacacct tcgcaatgcc attttttgcc tactttatat acagatgaaa attcctcgtt 360
tgtgctaaat ttatcaaaat ttttcacaca gcaagtcttt ttctaccttt agcgcgtctt 420
gcattgatca ctttgcgacc atttta 447

<210> 16
<211> 480
<212> DNA
<213> Baccillus anthracis

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tcatttcctt acgctacttt ttattctttt cataccagag cgtttaaaga catgaattaa 120
gcttttcttt aattcttcat atgtcatctc tgcacaaggc ttccttgcta ttataacaaa 180
atcttttcca gaatctatct catcttttaa ttctgtgatc gactggcgaa tcatacgttt 240
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atcaattgac actcctgtag ttcatcagcg gaaattcact attattagaa aaaaagacca 480

C1 Cont.

<210> 17
<211> 480
<212> DNA
<213> Mycobacterium avium

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cgccgacgac gcggtccggc ttccgggcag cgcgcgaatc accagccggt cggatggttc 180
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gtgcttcacc gtcgcgtcaa actcggttga ccgcgtcatg cggttgcgtg cgggaagcac 420
cgcgaaagac ctgacgtgcg atcaggcaga gagcgcgcgg cgacccttgc ggcgccgacc 480

<210> 18
<211> 474
<212> DNA
<213> Staphylococcus aureus

<400> 18
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atgttattgg aaaaagctta ccgaattaaa aagaatgcag attttcagag aatatataaa 120

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aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240
aagattaaaa gagcaatacg tgaaaatttc aaagtacata agtcgcatat attggccaaa 300
gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
agtcttgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga       474
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<210> 19
<211> 474
<212> DNA
<213> Staphylococcus aureus

<400> 19
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atgttattgg aaaaagctta ccgaattaaa aagaatgcag attttcagag aatatataaa 120
aaaggtcatt ctgtagccaa cagacaattt gttgtataca cttgtaataa taaagaaata 180
gaccattttc gcttaggtat tagtgtttct aaaaaactag gtaatgcagt gttaagaaac 240
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gatattattg taatagcaag acagccagct aaagatatga cgactttaca aatacagaat 360
agtcttgagc acgtacttaa aattgccaaa gtttttaata aaaagattaa gtaaggatag 420
ggtaggggaa ggaaaacatt aaccactcaa cacatcccga agtcttacct caga       474
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<210> 20
<211> 119
<212> PRT
<213> Streptococcus mutans

<400> 20
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Ile Phe Thr Glu Gly Arg Ser Val Ala Asn Arg Lys Phe Val Val Tyr
            20                  25                  30
Ser Leu Glu Lys Asp Gln Ser His Tyr Arg Val Gly Leu Ser Val Gly
        35                  40                  45
Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile Lys Arg Lys Leu
    50                  55                  60
Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Gly Thr Gln Asp Phe
65                  70                  75                  80
Val Val Ile Ala Arg Lys Gly Val Glu Glu Leu Asp Tyr Ser Thr Met
                85                  90                  95
Lys Lys Asn Leu Val His Val Leu Lys Leu Ala Lys Leu Tyr Gln Glu
            100                 105                 110
Gly Ser Ile Arg Glu Lys Glu
        115
```

C1 Cont

<210> 21
<211> 119
<212> PRT
<213> Klebsiella pneumoniae

<400> 21
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His Phe Thr Phe Val Phe Gln Gln Pro Gln Arg Ala Gly Thr Pro Gln
            20                  25                  30
Ile Thr Ile Leu Gly Arg Leu Asn Ser Leu Gly His Pro Arg Ile Gly
        35                  40                  45
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg
```

```
    50                  55                  60
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
65                  70                  75                  80
Pro Pro Met Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu
                85                  90                  95
Asp Asn Arg Ala Leu Ser Glu Ala Leu Glu Lys Leu Trp Arg Arg His
            100                 105                 110
Cys Arg Leu Ala Arg Gly Ser
        115
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<210> 22
<211> 110
<212> PRT
<213> Salmonella paratyphi

<400> 22

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Val Thr Phe Val Asn Ser Arg Ser Phe His Ile Arg Leu Pro Ala Thr
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Ser Thr Gly Cys Thr Pro Gln Ile Thr Ile Leu Gly Arg Leu Asn Ser
            20                  25                  30
Leu Gly His Pro Arg Ile Gly Leu Thr Val Ala Lys Lys Asn Val Arg
        35                  40                  45
Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr Arg Glu Ser Phe
    50                  55                  60
Arg Leu Arg Gln His Glu Leu Pro Ala Met Asp Phe Val Val Val Ala
65                  70                  75                  80
Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala Leu
                85                  90                  95
Glu Lys Leu Trp Arg Arg His Cys Arg Leu Ala Arg Gly Ser
            100                 105                 110
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C' cont.

<210> 23
<211> 135
<212> PRT
<213> Pseudomonas aeruginosa

<400> 23

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Val Val Ser Arg Asp Phe Asp Arg Asp Lys Arg Leu Leu Thr Ala Arg
 1                5                  10                  15
Gln Phe Ser Ala Val Phe Asp Ser Pro Thr Gly Lys Val Pro Gly Lys
            20                  25                  30
His Val Leu Leu Leu Ala Arg Glu Asn Gly Leu Asp His Pro Arg Leu
        35                  40                  45
Gly Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn
    50                  55                  60
Arg Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr
65                  70                  75                  80
Leu Ala Gly Trp Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu
                85                  90                  95
Leu Glu Asn Pro Glu Leu His Gln Gln Phe Gly Lys Leu Trp Lys Arg
            100                 105                 110
Leu Leu Arg Asn Arg Pro Arg Thr Glu Ser Pro Ala Asp Ala Pro Gly
        115                 120                 125
Val Ala Asp Gly Thr His Ala
    130                 135
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<210> 24
<211> 129
<212> PRT
<213> Corynebacterium diphtheriae

<400> 24
Val Thr Leu Thr Ser Ser Asn Arg Thr Thr Val Leu Pro Ser Gln His
 1   5   10   15
Lys Leu Ser Asn Ser Glu Gln Phe Arg Ala Thr Ile Arg Lys Gly Lys
            20   25   30
Arg Ala Gly Arg Ser Thr Val Val Leu His Phe Tyr Ala Glu Ala Thr
        35   40   45
Ala Gly Asn Leu Ala Thr Ala Gly Gly Pro Arg Phe Gly Leu Val Val
    50   55   60
Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln
65   70   75   80
Leu Arg His Val Val Ile Ala Met Lys Asp Gln Phe Pro Ala Ser Ser
                85   90   95
His Val Val Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu
            100   105   110
Glu Leu Arg Ala Asp Val Gln Ala Ala Leu Asp Lys Leu Asn Arg Lys
        115   120   125
Arg

<210> 25
<211> 119
<212> PRT
<213> Chlamydia trachomatis

<400> 25
Val His Arg Leu Thr Leu Pro Lys Ser Ala Arg Leu Leu Lys Arg Lys
 1   5   10   15
Gln Phe Val Tyr Val Gln Arg Cys Gly Gln Tyr Cys Arg Thr Asp Gln
            20   25   30
Ala Thr Leu Arg Ile Val Pro Ser Arg His Ser Asn Ile Arg Lys Val
        35   40   45
Gly Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg
    50   55   60
Phe Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu
65   70   75   80
Pro Ala Cys Gln Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn
                85   90   95
Phe Gly Lys Leu Ser Ala Asp Leu Leu Lys His Ile Pro Glu Ala Leu
            100   105   110
Pro Leu Val Thr Ser Ser Lys
        115

C' cont.

<210> 26
<211> 122
<212> PRT
<213> Vibrio cholerae

<400> 26
Ser Arg Ile Ile Leu Ser Thr Tyr Ala Phe Asn Arg Glu Leu Arg Leu
 1   5   10   15
Leu Thr Pro Glu His Tyr Gln Lys Val Phe Gln Gln Ala His Ser Ala

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            20                  25                  30
Gly Ser Pro His Leu Thr Ile Ile Ala Arg Ala Asn Asn Leu Ser His
        35                  40                  45
Pro Arg Leu Gly Leu Ala Val Pro Lys Lys Gln Ile Lys Thr Ala Val
    50                  55                  60
Gly Arg Asn Arg Phe Lys Arg Ile Cys Arg Glu Ser Phe Arg Leu His
65                  70                  75                  80
Gln Asn Gln Leu Ala Asn Lys Asp Phe Val Val Ile Ala Lys Lys Ser
                85                  90                  95
Ala Gln Asp Leu Ser Asn Glu Glu Leu Phe Asn Leu Leu Gly Lys Leu
            100                 105                 110
Trp Gln Arg Leu Ser Arg Pro Ser Arg Gly
        115                 120
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<210> 27
<211> 123
<212> PRT
<213> Neisseria gonorrhoea

<400> 27

```
Val Ile Leu Asp Tyr Arg Phe Gly Arg Gln Tyr Arg Leu Leu Lys Thr
 1               5                  10                  15
Asp Asp Phe Ser Ser Val Phe Ala Phe Arg Asn Arg Arg Ser Arg Asp
            20                  25                  30
Leu Leu Gln Val Ser Arg Ser Asn Gly Asn Gly Leu Asp His Pro Arg
        35                  40                  45
Ile Gly Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg
    50                  55                  60
Asn Tyr Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn
65                  70                  75                  80
Arg Leu Pro Pro Gln Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp
                85                  90                  95
Arg Ala Thr Ala Lys Gln Ala Arg Ala Glu Leu Ala Gln Leu Met Phe
            100                 105                 110
Gly Asn Pro Ala Thr Gly Cys Gly Lys Gln Val
        115                 120
```

C1 Cont.

<210> 28
<211> 123
<212> PRT
<213> Neisseria meningitidis

<400> 28

```
Val Ile Leu Asp Tyr Arg Phe Gly Arg Gln Tyr Arg Leu Leu Lys Thr
 1               5                  10                  15
Asp Asp Phe Ser Ser Val Phe Ala Phe Arg Asn Arg Arg Ser Arg Asp
            20                  25                  30
Leu Leu Gln Val Ser Arg Ser Asn Gly Asn Gly Leu Asp His Pro Arg
        35                  40                  45
Ile Gly Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg
    50                  55                  60
Asn Tyr Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn
65                  70                  75                  80
Arg Leu Pro Pro Gln Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp
                85                  90                  95
Arg Ala Thr Ala Lys Gln Ala Arg Ala Glu Leu Ala Gln Leu Met Phe
            100                 105                 110
```

Gly Asn Pro Ala Thr Gly Cys Arg Lys Gln Ala
115 120

<210> 29
<211> 113
<212> PRT
<213> Streptococcus pyogenes

<400> 29
Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Lys Asp Gly Lys Ser
1 5 10 15
Thr Ala Asn Arg Lys Phe Val Ile Tyr His Leu Asn Arg Gly Gln Asp
20 25 30
His Phe Arg Val Gly Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val
35 40 45
Thr Arg Asn Ala Val Lys Arg Lys Ile Arg His Val Ile Met Ala Leu
50 55 60
Gly His Gln Leu Lys Ser Glu Asp Phe Val Val Ile Ala Arg Lys Gly
65 70 75 80
Val Glu Ser Leu Glu Tyr Gln Glu Leu Gln Gln Asn Leu His His Val
85 90 95
Leu Lys Leu Ala Gln Leu Leu Glu Lys Gly Phe Glu Ser Glu Glu Lys
100 105 110
His

<210> 30
<211> 123
<212> PRT
<213> Bordetella pertussis

<400> 30
Met Pro Arg Ala Thr Leu Pro Ala Glu Ala Arg Leu His Arg Pro Ser
1 5 10 15
Glu Phe Ala Ala Ala Leu Lys Gly Arg Arg Leu Ala Arg Gly Ala Phe
20 25 30
Phe Ile Val Ser Ala Ser Pro Cys Ala Pro Ala Asp Asp Gln Pro Ala
35 40 45
Arg Ala Arg Leu Gly Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala
50 55 60
Val Thr Arg Asn Thr Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala
65 70 75 80
Arg Arg Leu Ala Leu Pro Ala Gln Asp Tyr Val Val Arg Leu His Ser
85 90 95
Lys Leu Thr Pro Ala Ser Leu Thr Ala Leu Lys Arg Ser Ala Arg Ala
100 105 110
Glu Val Asp Ala His Phe Thr Arg Ile Ala Arg
115 120

C1 Cont.

<210> 31
<211> 137
<212> PRT
<213> Porphyromonas gingivalis

<400> 31
Met Thr Ser Pro Pro Thr Phe Gly Leu Ser Lys Ser Glu Arg Leu Tyr

```
 1               5                  10                  15
Leu Arg Asp Glu Ile Asn Thr Val Phe Gly Glu Gly Lys Ala Phe Val
            20                  25                  30
Val Tyr Pro Leu Arg Val Val Tyr Arg Leu Gly Ser Glu His Arg Val
        35                  40                  45
Ala Tyr Ser Ser Met Leu Val Ser Val Ala Lys Lys Arg Phe Arg Arg
    50                  55                  60
Ala Val Lys Arg Asn Arg Val Lys Arg Leu Val Arg Glu Ala Tyr Arg
65                  70                  75                  80
Leu Asn Lys His Leu Leu Asn Asp Val Leu Gln Glu Arg Gln Ile Tyr
                85                  90                  95
Ala Thr Ile Ala Phe Met Val Val Ser Asp Glu Leu Pro Asp Phe Arg
            100                 105                 110
Thr Val Glu Arg Ala Met Gln Lys Ser Leu Ile Arg Ile Ala Gly Asn
        115                 120                 125
Val Pro Ser Ser Ala Leu Lys Asn Glu
    130                 135
```

<210> 32
<211> 124
<212> PRT
<213> Streptococcus pneumoniae

<400> 32

```
Val Leu Lys Lys Asn Phe Arg Val Lys Arg Glu Lys Asp Phe Lys Ala
 1               5                  10                  15
Ile Phe Lys Glu Gly Thr Ser Phe Ala Asn Arg Lys Phe Val Val Tyr
            20                  25                  30
Gln Leu Glu Asn Gln Lys Asn Arg Phe Arg Val Gly Leu Ser Val Ser
        35                  40                  45
Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile Lys Arg Arg Ile
    50                  55                  60
Arg His Ile Ile Gln Asn Ala Lys Gly Ser Leu Val Glu Asp Val Asp
65                  70                  75                  80
Phe Val Val Ile Ala Arg Lys Gly Val Glu Thr Leu Gly Tyr Ala Glu
                85                  90                  95
Met Glu Lys Asn Leu Leu His Val Leu Lys Leu Ser Lys Ile Tyr Arg
            100                 105                 110
Glu Gly Asn Gly Ser Glu Lys Glu Thr Lys Val Asp
        115                 120
```

C1 Cont.

<210> 33
<211> 114
<212> PRT
<213> Clostridium difficile

<400> 33

```
Met Asp Phe Asn Arg Thr Lys Gly Leu Lys Lys Asp Ser Asp Phe Arg
 1               5                  10                  15
Lys Val Tyr Lys His Gly Lys Ser Phe Ala Asn Lys Tyr Leu Val Ile
            20                  25                  30
Tyr Ile Leu Lys Asn Lys Ser Asp Tyr Ser Arg Val Gly Ile Ser Val
        35                  40                  45
Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val Arg Arg Leu
    50                  55                  60
Ile Lys Glu Ala Tyr Arg Leu Asn Ile Asp Glu Lys Ile Lys Pro Gly
65                  70                  75                  80
```

```
Tyr Asp Ile Val Phe Ile Ala Arg Val Ser Ser Lys Asp Ala Thr Phe
                85                  90                  95
Lys Asp Ile Asp Lys Ser Ile Lys Asn Leu Val Lys Arg Thr Asp Ile
            100                 105                 110
Ser Ile
```

<210> 34
<211> 108
<212> PRT
<213> Camphylobacter jejuni

<400> 34

```
Val Lys Asn Phe Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val
 1               5                  10                  15
Tyr Lys Val Gly Lys Lys Trp His Cys Glu Gly Val Ile Ile Phe Tyr
            20                  25                  30
Leu Asn Ser Tyr Glu Lys Lys Ile Ala Val Val Ala Ser Lys Lys Val
        35                  40                  45
Gly Lys Ala Val Val Arg Asn Arg Ser Lys Arg Ile Leu Arg Ala Leu
    50                  55                  60
Phe Ala Lys Phe Glu Arg Tyr Leu Gln Asp Gly Lys Tyr Ile Phe Val
65                  70                  75                  80
Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg Leu Glu Lys Asn
                85                  90                  95
Leu Lys Trp Gly Leu Lys Lys Leu Glu Cys Phe Lys
            100                 105
```

<210> 35
<211> 119
<212> PRT
<213> Bacillus anthracis

C1 cont.

<400> 35

```
Met Lys Lys Lys His Arg Ile Lys Lys Asn Asp Glu Phe Gln Thr Val
 1               5                  10                  15
Phe Gln Lys Gly Lys Ser Asn Ala Asn Arg Gln Phe Val Val Tyr Gln
            20                  25                  30
Leu Asp Lys Glu Glu Gln Pro Asn Phe Arg Ile Gly Leu Ser Val Ser
        35                  40                  45
Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile Lys Arg Met Ile
    50                  55                  60
Arg Gln Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Ser Gly Lys Asp
65                  70                  75                  80
Phe Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Glu
                85                  90                  95
Leu Lys Lys Ser Leu Ile His Val Phe Lys Arg Ser Gly Met Lys Arg
            100                 105                 110
Ile Lys Ser Ser Val Arg Lys
        115
```

<210> 36
<211> 119
<212> PRT
<213> Mycobacterium avium

<400> 36
Val Leu Pro Ala Arg Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala
 1   5   10   15
Thr Val Lys His Gly Thr Arg Met Ala Gln Pro Asp Ile Val Val His
            20   25   30
Leu Arg Arg Asp Ser Glu Pro Asp Asp Glu Ser Ala Gly Pro Arg Val
        35   40   45
Gly Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg
    50   55   60
Val Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu
65   70   75   80
Glu Pro Ser Asp Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr
                85   90   95
Ala Ser Ser Ala Arg Leu Ala Gln Glu Leu Gln Arg Cys Leu Arg Arg
            100   105   110
Met Pro Ala Gly Thr Gly Pro
        115

<210> 37
<211> 117
<212> PRT
<213> Staphylococcus aureus

<400> 37
Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln
 1   5   10   15
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val
            20   25   30
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser
        35   40   45
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg
    50   55   60
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys
65   70   75   80
Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu
                85   90   95
Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe
            100   105   110
Asn Lys Lys Ile Lys
        115

C' Cont.

<210> 38
<211> 117
<212> PRT
<213> Staphylococcus aureus

<400> 38
Met Leu Leu Glu Lys Ala Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln
 1   5   10   15
Arg Ile Tyr Lys Lys Gly His Ser Val Ala Asn Arg Gln Phe Val Val
            20   25   30
Tyr Thr Cys Asn Asn Lys Glu Ile Asp His Phe Arg Leu Gly Ile Ser
        35   40   45
Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile Lys Arg
    50   55   60
Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Leu Ala Lys
65   70   75   80

```
Asp Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu
                85                  90                  95
Gln Ile Gln Asn Ser Leu Glu His Val Leu Lys Ile Ala Lys Val Phe
            100                 105                 110
Asn Lys Lys Ile Lys
        115
```

<210> 39
<211> 71
<212> PRT
<213> Escherichia coli

<400> 39

```
Leu Arg Leu Leu Thr Pro Ser Gln Phe Thr Phe Val Phe Arg Ile Gly
 1               5                  10                  15
Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg
            20                  25                  30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
        35                  40                  45
Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
    50                  55                  60
Ala Leu Ser Glu Ala Leu Glu
65                  70
```

<210> 40
<211> 71
<212> PRT
<213> Proteus mirabilis

<400> 40

```
Leu Arg Leu Leu Thr Pro Lys His Phe Asn Phe Val Phe Arg Ile Gly
 1               5                  10                  15
Leu Thr Ile Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg
            20                  25                  30
Ile Lys Arg Leu Ala Arg Glu Tyr Phe Arg Leu His Gln His Gln Leu
        35                  40                  45
Asp Phe Val Val Leu Val Arg Lys Gly Val Ala Glu Leu Asp Asn His
    50                  55                  60
Gln Leu Thr Glu Val Leu Gly
65                  70
```

C' Cont.

<210> 41
<211> 71
<212> PRT
<213> Haemophilus influenzae

<400> 41

```
Leu Arg Leu Leu Thr Pro Ile Gln Phe Lys Asn Val Phe Arg Leu Gly
 1               5                  10                  15
Leu Thr Val Ala Lys Lys His Leu Lys Arg Ala His Glu Arg Asn Arg
            20                  25                  30
Ile Lys Arg Leu Val Arg Glu Ser Phe Arg Leu Ser Gln His Arg Leu
        35                  40                  45
Asp Phe Val Phe Val Ala Lys Asn Gly Ile Gly Lys Leu Asp Asn Asn
    50                  55                  60
Thr Phe Ala Gln Ile Leu Glu
```

65 70

<210> 42
<211> 71
<212> PRT
<213> Pseudomonas putida

<400> 42
Lys Asn Leu Leu Thr Pro Arg His Phe Lys Ala Val Phe Arg Leu Gly
1 5 10 15
Leu Val Ile Gly Lys Lys Ser Val Lys Leu Ala Val Gln Arg Asn Arg
20 25 30
Leu Lys Arg Leu Met Arg Asp Ser Phe Arg Leu Asn Gln Gln Leu Leu
35 40 45
Asp Ile Val Ile Val Ala Arg Lys Gly Leu Gly Glu Ile Glu Asn Pro
50 55 60
Glu Leu His Gln His Phe Gly
65 70

<210> 43
<211> 71
<212> PRT
<213> Buchnera aphidicola

<400> 43
Ser Lys Leu Leu Lys Ser Thr Asn Phe Gln Tyr Val Phe Arg Leu Gly
1 5 10 15
Leu Ser Ile Ser Arg Lys Asn Ile Lys His Ala Tyr Arg Arg Asn Lys
20 25 30
Ile Lys Arg Leu Ile Arg Glu Thr Phe Arg Leu Leu Gln His Arg Leu
35 40 45
Asp Phe Val Val Ile Ala Lys Lys Asn Ile Val Tyr Leu Asn Asn Lys
50 55 60
Lys Ile Val Asn Ile Leu Glu
65 70

C1 Cont.

<210> 44
<211> 71
<212> PRT
<213> Salmonella typhi

<220>
<221> VARIANT
<222> 31
<223> Xaa = Any Amino Acid

<400> 44
Leu Arg Leu Leu Thr Pro Ala His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys Asn Val Arg Arg Ala His Glu Arg Xaa Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
35 40 45
Asp Phe Val Val Val Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Ser Glu Ala Leu Glu

65 70

<210> 45
<211> 71
<212> PRT
<213> Yersinia pestis

<400> 45
Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys His Val Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu His Gln His Ala Leu
35 40 45
Asp Phe Val Val Leu Val Lys Lys Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Thr Glu Ala Leu Glu
65 70

<210> 46
<211> 71
<212> PRT
<213> Klebsiella pneumoniae

<400> 46
Leu Arg Leu Leu Thr Pro Ser His Phe Thr Phe Val Phe Arg Ile Gly
1 5 10 15
Leu Thr Val Ala Lys Lys Asn Val Lys Arg Ala His Glu Arg Asn Arg
20 25 30
Ile Lys Arg Leu Thr Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu
35 40 45
Asp Phe Val Val Val Ala Lys Arg Gly Val Ala Asp Leu Asp Asn Arg
50 55 60
Ala Leu Ser Glu Ala Leu Glu
65 70

C' Cont

<210> 47
<211> 66
<212> PRT
<213> Salmonella paratyphi

<400> 47
Ile Arg Leu Pro Ala Thr Ser Thr Arg Ile Gly Leu Thr Val Ala Lys
1 5 10 15
Lys Asn Val Arg Arg Ala His Glu Arg Asn Arg Ile Lys Arg Leu Thr
20 25 30
Arg Glu Ser Phe Arg Leu Arg Gln His Glu Leu Asp Phe Val Val Val
35 40 45
Ala Lys Lys Gly Val Ala Asp Leu Asp Asn Arg Ala Leu Ser Glu Ala
50 55 60
Leu Glu
65

<210> 48
<211> 71

<212> PRT
<213> Vibrio cholerae

<400> 48
Leu Arg Leu Leu Thr Pro Glu His Tyr Gln Lys Val Phe Arg Leu Gly
 1   5   10   15
Leu Ala Val Pro Lys Lys Gln Ile Lys Thr Ala Val Gly Arg Asn Arg
            20   25   30
Phe Lys Arg Ile Cys Arg Glu Ser Phe Arg Leu His Gln Asn Gln Leu
        35   40   45
Asp Phe Val Val Ile Ala Lys Lys Ser Ala Gln Asp Leu Ser Asn Glu
    50   55   60
Glu Leu Phe Asn Leu Leu Gly
65   70

<210> 49
<211> 71
<212> PRT
<213> Pseudomonas aeruginosa

<400> 49
Lys Arg Leu Leu Thr Ala Arg Gln Phe Ser Ala Val Phe Arg Leu Gly
 1   5   10   15
Leu Val Ile Gly Lys Lys Asn Val Lys Leu Ala Val Gln Arg Asn Arg
            20   25   30
Leu Lys Arg Leu Ile Arg Glu Ser Phe Arg His Asn Gln Glu Thr Leu
        35   40   45
Asp Ile Val Val Ile Ala Arg Lys Gly Leu Gly Glu Leu Glu Asn Pro
    50   55   60
Glu Leu His Gln Gln Phe Gly
65   70

<210> 50
<211> 71
<212> PRT
<213> Shewanella putrefaciens

C' Cont.

<400> 50
Leu Arg Leu Leu Thr Pro Ala Gln Phe Lys Ser Val Phe Arg Leu Gly
 1   5   10   15
Leu Thr Val Ala Lys Arg Tyr Val Lys Arg Ala Asn Gln Arg Asn Arg
            20   25   30
Ile Lys Arg Val Ile Arg Asp Ser Phe Arg Leu Asn Gln His Asn Ile
        35   40   45
Asp Ile Val Val Leu Val Arg Asn Gly Val Met Glu Met Glu Asn Ala
    50   55   60
Glu Leu Asn Gly Leu Ile Glu
65   70

<210> 51
<211> 71
<212> PRT
<213> Coxiella burnetii

<400> 51
Trp Arg Ile Arg Thr Thr Ala Glu Phe Arg Arg Ile Tyr Arg Leu Gly

```
 1               5                  10                  15
Val Val Ala Ser Lys Arg Asn Val Arg Lys Ala Val Trp Arg Asn Arg
            20                  25                  30
Val Arg Arg Val Val Lys Glu Ala Phe Arg Ile Arg Lys Lys Asp Leu
        35                  40                  45
Asp Ile Val Val Val Ala Lys Ala Ser Ser Val Glu Ala Asp Asn Lys
    50                  55                  60
Glu Leu Tyr Glu Cys Ile Asn
65                  70
```

<210> 52
<211> 70
<212> PRT
<213> Rickettsia prowazekii

<400> 52

```
Thr Ser Leu Lys Asn Gln Lys Glu Phe Glu Leu Ile Asn Leu Gly Ile
 1               5                  10                  15
Lys Val Ser Arg Lys Leu Asn Lys Lys Ala Val Val Arg Asn Lys Ile
            20                  25                  30
Lys Arg Arg Ile Arg His Leu Met Arg Ile Ile Val Asn Asp Ser Ala
        35                  40                  45
Ile Ile Ile Ile Pro Lys Lys Gly Phe Glu Glu Ile Asn Phe Ser His
    50                  55                  60
Leu Gln Tyr Glu Leu Ser
65                  70
```

<210> 53
<211> 73
<212> PRT
<213> Caulobacter crescentus

<400> 53

```
Glu Arg Leu Arg Lys Arg Pro Asp Phe Leu Leu Ala Ala Arg Val Gly
 1               5                  10                  15
Phe Thr Ala Thr Lys Lys Ile Gly Gly Ala Val Glu Arg Asn Arg Ala
            20                  25                  30
Lys Arg Arg Leu Arg Glu Ala Ala Arg Leu Val Leu Pro Leu Asp Tyr
        35                  40                  45
Val Phe Ile Ala Arg Gly Gly Thr Gly Thr Arg Glu Trp Ala Arg Leu
    50                  55                  60
Leu Asp Asp Val Lys Thr Ala Leu Ile
65                  70
```

C1 Cont.

<210> 54
<211> 74
<212> PRT
<213> Helicobacter pylori 26695

<400> 54

```
Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly
 1               5                  10                  15
Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile
            20                  25                  30
Lys Arg Arg Leu Arg Ser Leu Thr Leu Lys His Ala Ala Leu Cys Ala
        35                  40                  45
```

Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala
50 55 60
Leu Glu Lys His Phe Leu Glu Met Leu Thr
65 70

<210> 55
<211> 74
<212> PRT
<213> Helicobacter pylori J99

<400> 55
Asp Ser Leu Lys Asn Lys Ser Glu Phe Asp Arg Val Tyr Lys Leu Gly
1 5 10 15
Leu Ser Val Ser Lys Lys Val Gly Asn Ala Val Lys Arg Asn Leu Ile
20 25 30
Lys Arg Arg Leu Arg Ser Leu Val Thr Arg His Ala Ala Leu Cys Ala
35 40 45
Leu Val Phe Val Pro Arg Ser Asp Cys Tyr His Leu Asp Phe Trp Ala
50 55 60
Leu Glu Lys His Phe Leu Glu Met Leu Thr
65 70

<210> 56
<211> 74
<212> PRT
<213> Camphylobacter jejuni

<400> 56
Asp Lys Phe Ser Thr Asn Glu Glu Phe Ser Ser Val Tyr Lys Ile Ala
1 5 10 15
Val Val Ala Ser Lys Lys Val Gly Lys Ala Val Val Arg Asn Arg Ser
20 25 30
Lys Arg Ile Leu Arg Ala Leu Phe Ala Lys Phe Glu Arg Tyr Leu Lys
35 40 45
Tyr Ile Phe Val Ala Lys Asn Glu Ile Thr Glu Leu Ser Phe Ser Arg
50 55 60
Leu Glu Lys Asn Leu Lys Trp Gly Leu Lys
65 70

C1 Cont.

<210> 57
<211> 71
<212> PRT
<213> Neisseria gonorrhoeae

<400> 57
Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly
1 5 10 15
Leu Val Val Gly Lys Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr
20 25 30
Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu
35 40 45
Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys
50 55 60
Gln Ala Arg Ala Glu Leu Ala
65 70

<210> 58
<211> 71
<212> PRT
<213> Neisseria meningitidis

<400> 58
Tyr Arg Leu Leu Lys Thr Asp Asp Phe Ser Ser Val Phe Arg Ile Gly
 1   5   10   15
Leu Val Val Gly Glu Lys Thr Ala Lys Arg Ala Asn Glu Arg Asn Tyr
            20   25   30
Met Lys Arg Val Ile Arg Asp Trp Phe Arg Leu Asn Lys Asn Arg Leu
        35   40   45
Asp Phe Val Val Arg Val Arg Arg Lys Phe Asp Arg Ala Thr Ala Lys
    50   55   60
Gln Ala Arg Ala Glu Leu Ala
65   70

<210> 59
<211> 75
<212> PRT
<213> Bordetella pertussis

<400> 59
Ala Arg Leu His Arg Pro Ser Glu Phe Ala Ala Ala Leu Arg Leu Gly
 1   5   10   15
Leu Val Ile Ala Lys Arg Phe Ala Ala Arg Ala Val Thr Arg Asn Thr
            20   25   30
Leu Lys Arg Val Ile Arg Glu Ala Phe Arg Ala Arg Arg Leu Ala Leu
        35   40   45
Asp Tyr Val Val Arg Leu His Ser Lys Leu Thr Pro Ala Ser Leu Thr
    50   55   60
Ala Leu Lys Arg Ser Ala Arg Ala Glu Val Asp
65   70   75

<210> 60
<211> 70
<212> PRT
<213> Thiobacillus ferrooxidans

C' Cont

<400> 60
Asp Arg Leu Arg Gln Lys Val Ala Ile Gln Arg Thr Leu Arg Leu Gly
 1   5   10   15
Leu Ala Val Ser Arg Lys Val Gly Asn Ala Val Val Arg Asn Arg Ile
            20   25   30
Lys Arg Arg Leu Arg Glu Ala Phe Arg Gln Gln Ser Val Arg Thr Asp
        35   40   45
Val Leu Val Val Ala Arg Pro Ser Ala Arg Gln Leu Ser Met Arg Ala
    50   55   60
Met Gly Ala Tyr Leu Gln
65   70

<210> 61
<211> 70
<212> PRT
<213> Streptomyces bikiniensis

<400> 61
Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly
 1   5   10   15
Phe Val Val Ser Lys Ala Val Gly Gly Ala Val Val Arg Asn Gln Val
            20   25   30
Lys Arg Arg Leu Lys His Leu Val Cys Asp Arg Leu Ser Ala Leu Leu
        35   40   45
Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln
    50   55   60
Leu Ala Arg Asp Leu Asp
65   70

<210> 62
<211> 70
<212> PRT
<213> Streptomyces coelicolor

<400> 62
Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Thr Ala Val Arg Ala Gly
 1   5   10   15
Phe Val Val Ser Lys Ala Val Gly Val Ala Val Val Arg Asn Lys Val
            20   25   30
Lys Arg Arg Leu Arg His Leu Met Arg Asp Arg Ile Asp Leu Leu Leu
        35   40   45
Val Val Val Arg Ala Leu Pro Gly Ala Gly Asp Ala Asp His Ala Gln
    50   55   60
Leu Ala Arg Asp Leu Asp
65   70

<210> 63
<211> 74
<212> PRT
<213> Micrococcus luteus

<400> 63
Arg Arg Val Arg Thr Pro Ala Glu Phe Arg His Leu Gly Arg Ala Gly
 1   5   10   15
Phe Val Val Ser Lys Ala Val Gly Asn Ala Val Thr Arg Asn Arg Val
            20   25   30
Lys Arg Arg Leu Arg Ala Val Val Ala Glu Gln Met Arg Leu Val Leu
        35   40   45
Val Gln Val Arg Ala Leu Pro Ala Ala Ala Glu Ala Asp Tyr Ala Leu
    50   55   60
Leu Arg Arg Glu Thr Val Gly Ala Leu Gly
65   70

C' cont

<210> 64
<211> 71
<212> PRT
<213> Mycobacterium tuberculosis

<400> 64
Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly
 1   5   10   15
Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val
            20   25   30

```
Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp
        35                  40                  45
His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala
    50                  55                  60
Arg Leu Glu Gln Gln Leu Arg
65                  70
```

<210> 65
<211> 71
<212> PRT
<213> Mycobacterium leprae

<400> 65

```
Asn Arg Met Arg Arg Ser Ser Glu Phe Asp Ala Thr Val His Val Gly
 1               5                  10                  15
Leu Ile Ile Ala Lys Thr Val Gly Ser Ala Val Glu Arg His Arg Val
            20                  25                  30
Ala Arg Arg Leu Arg His Val Ala Arg Thr Met Leu Gly Glu Leu Asp
        35                  40                  45
Gln Val Val Ile Arg Ala Leu Pro Ser Ser Arg Asn Val Ser Ser Ala
    50                  55                  60
Trp Leu Ala Gln Gln Leu Arg
65                  70
```

<210> 66
<211> 71
<212> PRT
<213> Mycobacterium bovis

<400> 66

```
Asn Arg Met Arg Arg Ser Ala Asp Phe Glu Thr Thr Val Arg Val Gly
 1               5                  10                  15
Leu Ile Ile Ala Lys Ser Val Gly Ser Ala Val Glu Arg His Arg Val
            20                  25                  30
Ala Arg Arg Leu Arg His Val Ala Gly Ser Ile Val Lys Glu Leu Asp
        35                  40                  45
His Val Val Ile Arg Ala Leu Pro Ser Ser Arg His Val Ser Ser Ala
    50                  55                  60
Arg Leu Glu Gln Gln Leu Arg
65                  70
```

C1 Cont

<210> 67
<211> 71
<212> PRT
<213> Mycobacterium avium

<400> 67

```
Asn Arg Met Thr Arg Ser Thr Glu Phe Asp Ala Thr Val Arg Val Gly
 1               5                  10                  15
Leu Val Val Gly Lys Ala Val Gly Thr Ala Val Gln Arg His Arg Val
            20                  25                  30
Ala Arg Arg Leu Arg His Val Ala Arg Ala Leu Leu Gly Glu Leu Asp
        35                  40                  45
Arg Leu Val Ile Arg Ala Leu Pro Gly Ser Arg Thr Ala Ser Ser Ala
    50                  55                  60
Arg Leu Ala Gln Glu Leu Gln
```

65 70

<210> 68
<211> 50
<212> PRT
<213> Corynebacterium diphtheriae

<400> 68
His Lys Leu Ser Gln Phe Arg Ala Thr Ile Arg Phe Gly Leu Val Val
1 5 10 15
Ser Lys Ala Val Gly Asn Ala Val Thr Arg His Arg Val Ser Arg Gln
20 25 30
Leu Arg His Phe His Val Val Glu Leu Arg Ala Asp Val Gln Ala Ala
35 40 45
Leu Asp
50

<210> 69
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 69
Lys Asn Glu
1

<210> 70
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

C1 Cont.

<400> 70
Ala Phe Leu Glu Glu Lys Glu Arg
1 5

<210> 71
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 71
Ile Ala Arg Lys Pro Ala Ser Gln
1 5

<210> 72

<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 72
Leu Thr Tyr Glu
 1

<210> 73
<211> 70
<212> PRT
<213> Bacillus subtilis

<400> 73
Asn Arg Leu Lys Arg Ser Asp Asp Phe Arg Lys Val Phe Arg Val Gly
 1   5   10   15
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Met Arg Asn Arg Ile
            20   25   30
Lys Arg Leu Ile Arg Gln Phe Phe Gln Glu His Glu Gln Ala Leu Asp
        35   40   45
Tyr Ile Ile Ile Ala Arg Lys Pro Ala Ala Asp Met Thr Tyr Glu Glu
    50   55   60
Thr Lys Lys Ser Leu Gln
65   70

<210> 74
<211> 69
<212> PRT
<213> Bacillus halodurans

<400> 74
His Arg Ile Lys Lys Asn Asp Glu Phe Ser Arg Val Phe Arg Val Leu
 1   5   10   15
Ser Val Ser Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Arg Val Lys
            20   25   30
Arg Leu Ile Arg Thr Ser Ile Thr Glu Leu Lys Asp Glu Ile Asp Tyr
        35   40   45
Val Ile Ile Ala Arg Lys Pro Cys Ala Glu Met Thr Tyr Glu Gln Val
    50   55   60
Lys Gly Ser Leu Trp
65

C1 Cont.

<210> 75
<211> 70
<212> PRT
<213> Bacillus anthracis

<400> 75
His Arg Ile Lys Lys Asn Phe Glu Phe Gln Thr Val Phe Arg Ile Gly
 1   5   10   15
Leu Ser Val Ser Lys Lys Ile Gly Asn Ala Val Val Arg Asn Arg Ile
            20   25   30
Lys Arg Met Ile Arg Gln Ile Leu Lys Gln Asn Ile Ser Glu Ile Asp

```
        35                  40                  45
Phe Val Ile Leu Val Arg Lys Ser Val Leu Glu Leu Lys Tyr Ala Glu
    50                  55                  60
Leu Lys Lys Ser Leu Ile
65                  70
```

<210> 76
<211> 70
<212> PRT
<213> Mycoplasma capricolum

<400> 76

```
Arg Val Ile Lys Asp Arg Lys Glu Phe Gln Glu Ile Ile Lys Tyr Gly
 1               5                  10                  15
Ile Ser Val Gly Lys Lys Ile Gly Asn Ala Val Ile Arg Asn Lys Val
            20                  25                  30
Lys Arg Gln Ile Arg Met Ile Met Arg Glu Gln Phe Cys Asn Ile Asp
        35                  40                  45
Ile Ile Ile Ile Ile Asn Gln Gly Phe Leu Glu Leu Thr Phe Lys Thr
    50                  55                  60
Leu Ser Lys Leu Leu Ile
65                  70
```

<210> 77
<211> 71
<212> PRT
<213> Mycoplasma pneumoniae

<400> 77

```
His His Leu Arg Glu Arg Lys Val Phe Ala Ala Leu Leu Arg Ala Ala
 1               5                  10                  15
Val Ser Ile Ser Lys Thr Lys Tyr Lys Leu Ala Val Glu Arg Asn Leu
            20                  25                  30
Ile Arg Arg Gln Val Lys Ala Ile Phe Gln Gln Ile Ser Asn Asn Leu
        35                  40                  45
Asp Val Leu Val Ile Val Asn Lys Gly Phe Ile Glu Leu Thr Phe Lys
    50                  55                  60
Glu Lys Gln Thr Ile Phe Leu
65                  70
```

C1 Cont.

<210> 78
<211> 71
<212> PRT
<213> Mycoplasma genitalium

<400> 78

```
His Ser Leu Arg Arg Glu Lys Val Phe Thr Thr Ile Leu Arg Val Ala
 1               5                  10                  15
Ile Ser Ile Ala Lys Thr Lys Tyr Lys Leu Ala Val Gln Arg Asn Leu
            20                  25                  30
Ile Lys Arg Gln Ile Arg Ser Val Ile Met Ala Leu Gly His Gln Leu
        35                  40                  45
Asp Ile Leu Val Ile Ala Arg Lys Gly Val Glu Ser Leu Glu Tyr Gln
    50                  55                  60
Glu Lys Gln Lys Leu Phe Leu
65                  70
```

<210> 79
<211> 68
<212> PRT
<213> Streptococcus pyogenes

<400> 79
Val Lys Ser Asp Lys Asp Phe Gln Ala Ile Phe Arg Val Gly Ile Ser
 1   5   10   15
Val Gly Lys Lys Ile Gly Asn Ala Val Thr Arg Asn Ala Val Lys Arg
            20   25   30
Lys Ile Arg His Val Leu Met Glu Leu Gly Pro Tyr Leu Asp Phe Val
        35   40   45
Val Ile Ala Arg Lys Gly Val Glu Glu Leu Asp Tyr Ser Glu Leu Gln
    50   55   60
Gln Asn Leu His
65

<210> 80
<211> 70
<212> PRT
<213> Streptococcus mutans

<400> 80
Tyr Arg Val Lys Arg Glu Lys Asp Phe Gln Ala Ile Phe Arg Val Gly
 1   5   10   15
Leu Ser Val Gly Lys Arg Leu Gly Asn Ala Val Val Arg Asn Ala Ile
            20   25   30
Lys Arg Lys Leu Arg His Ile Ile Gln Asn Ala Lys Gly Ser Leu Asp
        35   40   45
Phe Val Val Ile Ala Arg Lys Gly Val Glu Thr Leu Gly Tyr Ala Thr
    50   55   60
Met Lys Lys Asn Leu Val
65   70

<210> 81
<211> 70
<212> PRT
<213> Streptococcus pneumoniae

C1 cont.

<400> 81
Phe Arg Val Lys Lys Asn Ala Asp Phe Lys Ala Ile Phe Arg Val Gly
 1   5   10   15
Leu Ser Val Ser Lys Lys Leu Gly Asn Ala Val Thr Arg Asn Gln Ile
            20   25   30
Lys Arg Arg Ile Arg His Asn Phe Lys Val His Lys Ser His Leu Asp
        35   40   45
Phe Val Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Glu
    50   55   60
Met Glu Lys Asn Leu Leu
65   70

<210> 82
<211> 70
<212> PRT
<213> Staphylococcus aureus NCTC

<400> 82
Tyr Arg Ile Lys Lys Asn Ala Asp Phe Gln Arg Ile Tyr Arg Leu Gly
 1   5   10   15
Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile
            20   25   30
Lys Arg Ala Ile Arg Glu Asn Phe Lys Val His Lys Ser His Ile Asp
        35   40   45
Ile Ile Val Ile Ala Arg Gln Pro Ala Lys Asp Met Thr Thr Leu Gln
    50   55   60
Ile Gln Asn Ser Leu Glu
65   70

<210> 83
<211> 70
<212> PRT
<213> Staphylococcus aureus COL

<400> 83
Tyr Arg Ile Lys Lys Asp Ser Asp Phe Gln Arg Ile Tyr Arg Leu Gly
 1   5   10   15
Ile Ser Val Ser Lys Lys Leu Gly Asn Ala Val Leu Arg Asn Lys Ile
            20   25   30
Lys Arg Ala Ile Arg Glu Ala Tyr Arg Leu Asn Ile Asp Glu Lys Ile
        35   40   45
Asp Ile Ile Val Ile Ala Arg Val Ser Ser Lys Asp Ile Asp Lys Gln
    50   55   60
Ile Gln Asn Ser Leu Glu
65   70

<210> 84
<211> 70
<212> PRT
<213> Clostridium difficile

<400> 84
Lys Gly Leu Lys Asn Ser Glu Asp Phe Arg Lys Val Tyr Arg Val Gly
 1   5   10   15
Ile Ser Val Ser Lys Lys Val Gly Lys Ala Ile Thr Arg Asn Arg Val
            20   25   30
Arg Arg Leu Ile Lys Glu Val Val Ile Ala Met Lys Asp Gln Ile Asp
        35   40   45
Ile Val Phe Val Arg Ala Ile Pro Pro Ala Ala Thr Ala Ser Tyr Glu
    50   55   60
Ser Ile Lys Asn Leu Val
65   70

C1 cont.

<210> 85
<211> 71
<212> PRT
<213> Synechocystis PCC6803

<400> 85
Leu Arg Leu Lys His Trp Gln Asp Phe Gln Thr Val Tyr Arg Phe Gly
 1   5   10   15
Ile Thr Val Ser Gln Lys Val Ser Lys Lys Ala Thr Val Arg Asn Arg
            20   25   30

Leu Lys Arg Gln Ile Arg Ala Val Ile Asn His Phe Gln Pro Gln Ile
35 40 45
Asp Val Val Ile Ile Val Leu Pro Gln Gly Ile Gly Cys Asn Tyr Glu
50 55 60
Arg Phe Leu Arg Glu Leu Glu
65 70

<210> 86
<211> 71
<212> PRT
<213> Pseudanabaena PCC6903

<400> 86
Asn Arg Leu Arg Arg Arg Glu Asp Phe Ala Lys Val Tyr Arg Ile Gly
1 5 10 15
Ile Val Val Ser Lys Lys Val Ser Lys Leu Ala Val Thr Arg Asn Arg
20 25 30
Phe Lys Arg Gln Leu Arg Ala Ile Phe Arg Gln Leu Leu Ser Gln Leu
35 40 45
Gln Ile Val Val Thr Val Thr Thr Val Ala Ser Lys Pro Asn Tyr Gln
50 55 60
Glu Leu Gly Asp Asp Leu Lys
65 70

<210> 87
<211> 70
<212> PRT
<213> Borrelia burgdorferi

<400> 87
Ile Ser Leu Lys Ser Lys Ile Glu Ile Gln Lys Ile Phe Arg Ile Leu
1 5 10 15
Val Thr Phe Ser Lys Gly Phe Arg Gly Ser Val Lys Arg Asn Arg Ile
20 25 30
Arg Arg Leu Phe Lys Glu Ala Phe Arg Lys Arg Leu Glu Leu Leu Asp
35 40 45
Ile Ile Phe Val Val Ser Tyr Gly Lys Leu Thr Leu Thr Tyr Phe Ser
50 55 60
Ile Glu Ser Leu Met Lys
65 70

C1 cont.

<210> 88
<211> 71
<212> PRT
<213> Treponema pallidum

<400> 88
Glu Arg Leu Arg Gly Ser Cys Arg Val Arg Ala Val Phe Arg Phe Leu
1 5 10 15
Ala Thr Phe Arg Arg Gly Tyr Gly Lys Ala Val Ala Arg Asn Arg Ala
20 25 30
Arg Arg Leu Ser Lys Glu Ala Tyr Arg Ala Leu Lys Ser Ser Leu Asp
35 40 45
Leu Val Leu Leu Val Ser Val Val Glu Asp Ser Leu Ala Ala Tyr Gln
50 55 60
Arg Leu Leu Cys Val Leu Cys

65 70

<210> 89
<211> 73
<212> PRT
<213> Chlamydia trachomatis

<400> 89
Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly
1 5 10 15
Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe
20 25 30
Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln
35 40 45
Val Val Ile Ser Pro Arg Gly Asn Ser Gln Pro Asp Phe Leu Lys Leu
50 55 60
Ser Glu Glu Leu Leu Gln Arg Ile Pro
65 70

<210> 90
<211> 73
<212> PRT
<213> Chlamydia trachomatis MoPn

<400> 90
Ala Arg Leu Leu Lys Arg Lys Gln Phe Val Tyr Val Gln Lys Val Gly
1 5 10 15
Val Thr Val Ser Lys Lys Phe Gly Lys Ala His Gln Arg Asn Arg Phe
20 25 30
Lys Arg Ile Val Arg Glu Ala Phe Arg His Val Arg Pro Asn Leu Gln
35 40 45
Val Val Val Ser Pro Lys Gly Gly Thr Leu Pro Asn Phe Gly Lys Leu
50 55 60
Ser Ala Asp Leu Leu Lys His Ile Pro
65 70

C1 Cont

<210> 91
<211> 74
<212> PRT
<213> Chlamydia pneumoniae

<400> 91
Ser Arg Val Leu Lys Arg Lys Gln Phe Leu Tyr Ile Thr Arg Met Gly
1 5 10 15
Ile Thr Val Ser Lys Lys Phe Gly Lys Ala His Glu Arg Asn Ser Phe
20 25 30
Lys Arg Val Val Arg Glu Val Phe Arg His Val Arg His Gln Leu Gln
35 40 45
Ile Val Val Phe Pro Lys Gly His Lys Gln Arg Pro Val Phe Ser Lys
50 55 60
Leu Leu Gln Asp Phe Ile Asn Gln Ile Pro
65 70

<210> 92
<211> 74

<212> PRT
<213> Thermotoga maritima

<400> 92
Glu Arg Leu Arg Leu Arg Arg Asp Phe Leu Leu Ile Phe Arg Leu Gly
 1   5   10   15
Ile Val Val Lys Arg Lys Phe Gly Lys Ala Thr Arg Arg Asn Lys Leu
            20   25   30
Lys Arg Trp Val Arg Glu Ile Phe Arg Arg Asn Lys Gly Val Ile Asp
        35   40   45
Ile Val Val Ile Pro Arg Lys Lys Leu Ser Glu Glu Phe Glu Arg Val
    50   55   60
Asp Phe Trp Thr Val Arg Glu Lys Leu Leu
65   70

<210> 93
<211> 78
<212> PRT
<213> Porphyromonas gingivalis

<400> 93
Glu Arg Leu Tyr Leu Arg Asp Glu Ile Asn Thr Val Phe Ser Met Leu
 1   5   10   15
Val Ser Val Ala Lys Lys Arg Phe Arg Arg Ala Val Lys Arg Asn Arg
            20   25   30
Val Arg Arg Leu Val Arg Glu Ala Tyr Arg Leu Asn Lys His Leu Leu
        35   40   45
Asp Val Leu Gln Glu Arg Gln Ile Tyr Ala Thr Ile Ala Phe Met Val
    50   55   60
Val Ser Asp Glu Leu Pro Asp Phe Arg Thr Val Glu Arg Ala
65   70   75

<210> 94
<211> 77
<212> PRT
<213> Deinococcus radiodurans

C1 Cont

<400> 94
Leu Arg Gly Glu Arg Glu Phe Arg Lys Val Arg Arg Ile Gly Leu Val
 1   5   10   15
Val Ser Lys Lys Thr Leu Lys His Ala Val Lys Arg Asn Arg Ala Arg
            20   25   30
Arg Arg Val Arg Glu Ala Leu Arg Thr Met Pro Pro Glu Leu Arg Ala
        35   40   45
Ile Leu Met Leu Asn Pro Gly Val Leu Thr Val Pro Phe Pro Glu Leu
    50   55   60
Gln Ala Ala Leu Ala Gln Ala Leu Gln Arg Gly Ala Gly
65   70   75

<210> 95
<211> 75
<212> PRT
<213> Chlorobium tepidum

<400> 95
Ala Arg Leu Lys Gly Gly Phe Leu Leu Leu Ile Arg Val Leu Phe Thr

```
 1               5                  10                  15
Val Gly Lys Lys Leu Val Pro Arg Ala Val Asp Arg Asn Arg Ile Lys
            20                  25                  30
Arg Leu Met Arg Glu Ala Tyr Arg Leu Glu Lys Asn Ile Leu Asp His
        35                  40                  45
Gln Val Met Leu Ala Phe Leu Tyr Arg Ala Arg Ala Asp Ala Ile Pro
    50                  55                  60
Ser Leu Glu Arg Phe Arg Ala Ile Arg His Met
65                  70                  75
```